FADCA>BEACON

THE FLORIDA AMATEUR DIGITAL COMMUNICATIONS ASSOCIATION NEWSLETTER

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PACKET SEMINAR AT 25TH TROPICAL HAMBOREE
BY, JOEL KANDEL KI4T

THE DADE RADIO CLUB OF MIAMI HAS SET ASIDE A LARGE SLICE OF TIME FOR A FULL BLOWN PACKET RADIO SEMINAR TO BE GIVEN AT THE MIAMI HAMBOREE. THE DATES FOR THE HAMBOREE ARE FEBRUARY 2 AND 3, 1985. A CALL FOR PAPERS IS NOW OUT, AND LETTERS HAVE BEEN MAILED TO VARIOUS LUMINARIES OF THE PACKET WORLD INVITING THEM TO THE MIAMI SEMINAR.

THE SEMINAR WILL HAVE AN APPLICATIONS THEME. RATHER THAN FOCUS ON THE DIFFICULT THEORETICAL ISSUES OF PACKET RADIO AND DIGITAL SIGNAL TRANSMISSION, THE SEMINAR WILL ADDRESS ITSELF TO THE PRACTICAL WAYS IN WHICH AMATEURS CAN BETTER USE PACKET RADIO IN THEIR SHACKS.

EMERGENCY COMMUNICATIONS WILL BE ONE OF THE TOPICS DISCUSSED, AS WELL AS THE BEST WAYS TO ADJUST EQUIPMENT FOR OPTIMUM SIGNAL TO NOISE RATIO AND SIGNAL BANDPASS FILTERING.

THE SEMINAR WILL TENTATIVELY TAKE PLACE SUNDAY, THE 3RD, FROM 10 AM TO 4 PM. PAUL RENALDO OF ARRL, LYLE JOHNSON, PRESIDENT OF TAPR, AND PETE EATON HAVE ALREADY ACCEPTED INVITATIONS TO ATTEND. WE HOPE ALL INTERESTED WILL TAKE THE OPPORTUNITY TO ATTEND AND SUPPORT THE SEMINAR. THE PAPERS WILL BE PUBLISHED.

FADCA VOICE NETS

REGIONAL: 3958 KHz Sunday at 8 AM.
LOCAL:
BRANDON - 147.165 +600 Sunday at 7:30 PM.
(Hillsboro and Pinellas counties and surrounding area.)
BREVARD Co.- 147.060 +600 Sunday at 8 PM.
ORLANDO - 147.285 +600 Sunday at 9 PM.
SOUTHNET statewide packet freq. 145.010.
QSY to 145.030/050/070/090 for local file transfers

DIGITAL EVENTS

FADCA packet demonstration at TBRA meeting in Tampa, October 9th. Details on 146.76/16.
TAMPA Hamfest and FADCA Demonstration, Oct 20. Contact N4ZQ to offer assistance.
CLEARWATER (Sand Key) Hamfest and FADCA Seminar, November 24/25. Contact K4RHD.
BROWARD Hamfest and FADCA Seminar, Dec 1/2. Contact K4GFG to offer assistance.
MIAMI Hamboree and Packet happening, Feb 2/3. Begin writing your packet applications papers now!

NEWS AND VIEWS
Gwyn Reedy, W1BEL
812 Childers Loop, Brandon, FL 33511

This issue of the BEACON has a number of varied articles and features. I get some comments about the BEACON and I try to take them into consideration, but I look forward to more feedback than has come in so far. The readers of the BEACON are a varied group and I intend to cater to all of them if possible. We in FADCA have earned a reputation throughout the packet community for the quality and scope of our accomplishments, both technical and operational. A great number of our readers are located outside of the SOUTHNET region, including most of the other packet organizations and manufacturers. The "heavy" technical material is of value to those readers as well as our own developers. The lighter technical material should be of use to those getting a packet station going and up to peak efficiency. I would like to see more introductory material for those just getting started. We do have a program to distribute introductory material at hamfests and to those who write in for information. If you would like to obtain some of that material please write. Ted Huf and Jim Diggs have written beginner oriented articles this month and I strongly solicit additional articles of that type. There is still a need for regular operating activity columns from the Jacksonville, Orlando, and Miami areas. Finally, a glossary of terms, acronyms, etc would be valuable for an article and newcomer handouts. In summary, the BEACON needs a mix of national material gleaned from other newsletters to inform us of what others are doing; local/regional material to let us communicate among ourselves and show our progress to other regions; and technical material covering the range from tutorial to advanced level. With the support of FADCA members in collecting and generating this data I feel we can improve the BEACON and insure its continued success and usefulness.

This issue of the BEACON was mailed a few days into October. The October issue will get out about three weeks after this one. Thank you for your patience. Most of the delay is due to the cryptic error message that appears at the end of this article.

This issue contains several pieces dealing with the considerations affecting the selection of a microprocessor chip to perform duty as a network controller. Next month I will try to include a tutorial about networking and relate this month's issues to

networking software considerations and the results of the ARRL Digital Committee that I attended in mid-September.

There is a letter to the editor section this month, but very little to print in it. If you have something to pass to others, but are not up to writing an article, send it in a letter.

Rich Challen of the Atlanta area designed a 6502 based microcomputer board several years ago that allows a keyboard and CRT to become a sophisticated graphics terminal. A number of these boards were produced for hobbyists along the East Coast. Now the Atlanta CP/M group has redone the board layout and is planning a production run. This board might be useful for experiments in transmitting graphic images via packet. Interested? Contact me!

Pete Eaton, WB9FLW, and Stan Wilson, AK0B, report that the St. Louis Amateur Packet Radio Club is alive and well and will resume publication of the SLAPR PROTOCOL next month. Very glad to hear that. SLAPR was a pioneering local group that served as an inspiration for the formation of FADCA.

St. Louis stations were able to begin digipeated connections with the Chicago area this month. WB4APR reported the first effective EASTNET connection between Washington and Boston on Aug 6th. The level of packet activity is growing throughout the country and it won't be too long before a wide range network can be initiated. High speed linking is further off, of course, but well into development.

NK4K in Miami has his 24 hour BBS back in operation. A team of amateurs in Hollywood are building an elaborate digipeater/gateway that will allow interconnection of 144/220/440 MHz and allow access by RTTY stations. More details have been requested for later publication.

Pat, KF4EF and I presented a packet demonstration at the South Hillsboro Amateur Radio Klub (SHARK) on Sept. 26th. The group was very interested and enjoyed the packet contacts made with stations on the Tampa LAN. Two amateurs (W4ABV and KB4GHE) purchased TAPR kits on the spot and several others declared intentions to order from TAPR 'right soon now.' Vancouver boards and GLB boards were also demonstrated, but no consignment units were available. FADCA demonstrations attempt to fairly represent all packet radio products and approaches.

Another demonstration will be held for the Tampa Bay Repeater Association on Tuesday, Oct 9th. The expression of interest by this voice repeater organization is especially significant for the growth of the TAMPA LAN. Our number is now 21 strong and completion of the wide area digipeater and 220 MHz linking to Melbourne should spur considerable additional growth.

I get so many pieces of information about activity in the state that I would like to publish, but they often get lost before publication time. (You should see the piles of paper around this house!) Would someone like to volunteer to keep notes during each of the 75 meter nets and write up a monthly net report for publication? I hope so!!

There have been some stimulating discussions on the Brandon voice repeater about the ways to get more compatibility among packet user terminals and computers. Also such topics as standard message commands, formats, video display formats, etc. N2WX discussed the desirability of adopting a virtual terminal standard in one of his articles about six months ago, but the response was almost nil. There is a lot of pioneering work to be done is determining what is needed and how to accomplish it in a form suitable for adoption throughout the packet community. Who will step up to begin some solid analysis? A programming design language (PDL) is a form of virtual software and this would also be useful territory to explore for the packet users. Now is the time to address some of these issues; before we are all networked and are limited to straight ASCII transfers except to persons with identical terminal equipment.

Saw my first want ad for a used packet board in the Ham Trader Yellow Sheets. TAPR kit for $250. Wonder if he didn't like what he saw on packet? Hope that wasn't the case. One of the neatest things about this mode has been the super people that it puts me in contact with. Hope it stays that way.

On the subject of classified ads, send them in to the BEACON. Digitally oriented are preferred, but FADCA members cleaning out the shack to get cash for new digital gear will be fully supported also, HI. I'll start it off this month myself.

For Sale: HY-GAIN TH6-DXX "THUNDERBIRD". In excellent condition with stainless steel hardware. Make an offer that will support my digital habit! W1BEL.

Bdos error on B: Bad Sector

LETTERS TO FADCA

Note: This section temporarily vacant until readers send in some letters! Technical, operational, emotional...you name it (and send it in.)

Melbourne Digipeater log Sept 23, 1984

```
/mlblog
N2WX-7>W1BEL: N2WX/R hrd
W1BEL -0
N4BE  -0 WB9IVR-0
WA4IYY-0 KF4I  -0
N2WX  -0 K4NTA -0
K4RHD -0 K3AAX -1
K3AAX -0 ABCDEF-0
VE3ILW-0 KB4IU -0
K4AHO -0 K4OQ  -0
KF4WM -0 K4NTA -2
WA3QFN-0 WB4TRJ-0
K4GFG -0 W4PCM -0
0VE3IL-7 AC7N  -0
WD4LHF-0 KA4HLO-0
KF4EF -0
```

Wonder who ABCDEF-0 is? That is a GLB board without a callsign in the EPROM.

BYTES FROM THE WRITE ONLY MEMORY

by Ted Huf, K4NTA
1829 N.W. Pinetree Way, Stuart, Fl 33494

Because of the many new stations coming on the air with packet radio, I thought that I would talk a little bit about operating proceedures.

Packet radio operation is in some ways just like voice, CW or RTTY. For example, you make a call to another station, he answers, you talk and both say 73 and sign. In packet you establish a connection by having your TNC send a connect request. The other station's TNC hears the connect request and sends back an acknowledgement (ack). Both TNC's inform the operators that they are connected and the QSO proceeds. When the QSO ends, one or both stations instructs his TNC to send a disconnect request. The other end will receive the disconnect request and send back a disconnect ack. Then both operators will be informed that they are disconnected.

It is possible to do a manual disconnect. This is when you disconnect your end and don't wait for the ack from the other guy. On the TAPR TNC you do it by typing D<cr>D<cr>. The second D<cr> gets to the TNC and stops any further transmissions of the disconnect request. On the GLB this is done by typing MD (manual disconnect). If the operator is sitting as his keyboard, this manual disconnect should not cause any problem, but if he is not there, his TNC will think that it is still connected to you and it will block out anyone else. This can be a real problem for people who expect to receive messages in their buffer. They end up with your message and a bunch of connect requests in the buffer. The point is if you disconnect, make sure the other end is disconnected by waiting for the disconnect ack. (Ed. note: If signals fade and the connection is lost, you may be unable to disconnect properly, so do not always question the parentage of those that leave you connected and disappear.)

Digipeaters are very important to packet radio. They extend the range, like voice repeaters, but you are also allowed to link digpeaters together to extend the range even farther. In addition to the wide area overage digipeaters that we have in Florida, individual home stations my be used to digipeat. When setting up a connection via one or more digipeaters there are a few things to keep in mind. The first digipeater's call that you enter should be the one closest to you. It must be able to hear your TNC and be heard by you. The next one must be able to receive and transmit to the first and so forth. The protocol sets the limit to 8 digipeaters, but in practice, I have never been very successful using that many. Try to keep the number of digipeaters to a minimum and if you can connect with out using one, do so, because this will get the packets through faster and cut down on the channel loading.

On the TAPR TNC, (I am not sure it is done on the GLB) you can set up digipeaters to repeat unconnected or unprotocol beacons and other packets. This can get what you have to say to a wide area. For example, if you were in Orlando and wanted to send a CQ to West Palm Beach (200 miles away) you might set "UNPROTO CQ VIA N2WX-7, K4NTA-1, WA4ARE-1". If you then set your beacon text to read "CQ WPB - CONNECT VIA K2WX-7, K4NTA-1, WA4ARE-1" and send beacons, you will let the West Palm Beach packeteers know that you are on and looking for a contact. Hopefully the guy in WPB would know that he will have to reverse the order of the digipeaters from what you had in your beacon text to connect with you. WA4ARE-1 is in West Palm Beach. By the way, after you make the connect, it is a good idea to turn off the beacon.

When transmitting in the unconnected or unproto mode, you are not connected to anyone therefore if your packet gets clobbered, it will not be retried. The way that the protocol and software is now, there is no good way to carry on a round table. About the only thing that you can do is use the unprotocol mode and hope for the best. If you set your UNPROTO field to FADCA (or anything-CQ, etc.) via XXXXX where XXXXX is one of the stations in the round table, you will know your message was received if you print the echo on your terminal. That doubles the activity on the channel, however.

The Melbourne LAN digipeater, N2WX-7 has a special feature not found on any other that I know of. It has a "heard log". This log stores the call letters of all the stations that the digipeater has heard since it was last reset. To activate the log, go into unproto mode (unconnected) and send a frame that says "/MLBLOG<cr>". Make sure that that you set up your unproto vias so N2WX-7 can hear your frame, but do NOT include N2WX-7 as the last digipeater. If you do, N2WX-7 will never hear your frame becuse it can not hear the same frame that it transmits. Remember you must not be connected to anyone when you do this. It may take a couple of trys for the log to come back to you via the digipeaters that you specified because it is unconnected and will not retry. Howie, N2WX really did a good job on the Xerox 820 repeater software and hardware add-ons (state machine). The homebrewed 2211/2208 modem was provided by Dave K4AAX and Jerry N4AJH and the radio by Dave.

This month Howie and I made a demo at the Vero Beach Radio Club. We were wll received and I think the Vero guys enjoyed the demo. The band was in pretty good shape and we were able to make connections with Gainsville and Jacksonville via N2WX-7.

FADCA was at the Melbourne Hamfest in September with a booth and packet radio forum. W1BEL did a super job with the forum, giving a standing room only group a good introduction to packet radio. Howie N2WX, Dave K3AAX and Jerry N4AJH manned the booth. Saturday night we had a dinner meeting with about 25 people there.

During the hamfest, a meeting was held of the FADCA High Speed Linking Committee. It was decided to continue with plans for GATOR LINK 1 on 220 Mhz using the Xerox 820-1 boards. The plans are to modify some Hamtronics 220 boards for FSK and try to get the highest

baud rate out of them without changing the crystal filters. We are planning for the first link to be between Melbourne and Tampa, a distance of over 100 miles. We will use some 250-300 watt FAA surplus amps that K4RHD and W4APV have. This is a long path for linking, but it was desided to use these sites because Howie is close to Melbourne and Jim and Bill are at Tampa. We need these guys near the hardware in case of trouble. Tom, K4GFG, the RF hardware committee chairman is checking the the Hamtronics boards to come up with the needed modifications for FSK and determine the maximum baud rate. We need someone willing to do wire wrap work on the Zilog SCC chip, two meter 2211/2208 modem and radio interface. Anyone who can wire wrap a couple of thee boards should contact Howie, Gwyn or me. We had thought that we would use the AMD 7910 World Modem or the TI 3101 for the modem for the two meter modem for GATOR 1 but there is a problem with the carrier detect on both chips. It seems that since these modems are intended for use on phone lines, the designers made a carrier detect that will indicate a carrier with noise on the input. This is no good for radio. We want to use the descriminator output and therefore there is noise all the time. The 2211/2208 modem that Dave and Jerry worked up seem to work very well and in fact, it was found to work better than the 7910 on N2WX-7.

Rumor has it that Radio Shack will be putting the Model 100 on sale again next month for around $200 off. This is their lap portable that runs on batteries. This little computer will make an ideal terminal for emergency communications, especially when someone comes up with a battery operated TNC. Remember now this sale on the Model 100 is just a rumor so don't come looking for me if they don't do it.

I have 4 double sided disk drives ordered for my TRS-80 Model 3. As I only have 2 single siders now, this will really add a lot of disk storage to the ole K4NTA FADCA Southnet BBS. If you have tried to upload files to the BBS you may have noticed that I am kind of skinny of file space. With the BBS that I am using, the programs and files must be on drive 0 along with DOS and Basic. With the new drives I can have a whole double sided drive for files. Another thing I am working on is a better method of uploading. Now you must send one line and wait for the BBS to send a colon (:) before sending the next one. I want it to be able to handle a normal file dump with out the pacing. I am having a little trouble with this one. I can't seem to get the dern TNC to stop sending to the computer when I want it to. It seems to work fine until basic goes off to write to disk. I am sure it is just some dumb bug that I have put in it and I will keep working on it as time permits. By the way, I plan to install all four of these half high drives in the Model 3 and use DOSPLUS 3.5. If anyone has ever made an installation like this, I would like to hear from you with suggestions.

We are all looking foward to the Lake Wales digipeater, KE4PM-1 coming back on line. This time it will be with a GLB purchased through contributions from the Tampa and Orlando area members, and a radio furnished by KE4PM. Thanks also to the donors of the site at Lake Wales.

PACKET RADIO - A FIRST AT THE OLYMPICS

Reprinted and condensed
from
"WORLDRADIO", Oct. 1984

The site of the 1984 Olympic Soccer matches: Stanford University, Palo Alto, California became the first use of Packet Radio during an Olympic event.

The Los Angeles Olympic Organizing Committee (LAOOC) was having a problem with messages being taken from a Centrex telephone system that had 60 telephones that would ring back to a central point when busy or rang five time. Complicating the problem, the message center was located two miles from the place the messages needed to be delivered.

When the subject of hard-copy messages via a point-to-point radio circuit was first discussed with the message center, loud cries could be heard: "We don't know how to run computers," "We don't want a complicated system," and "How much will it cost?" When told this was an experiment and they did not have to pay anything, they seemed to be resigned that this group of radio amateurs was willing to do almost anything to solve problems. After all, the LAOOC had already agreed to a 60-foot portable tower trailer, KT-34, wire dipoles for 40 and 80, to be located inside the security fence in the administrative area, the purchase of 78 ICOM 2AT's and the large Red Cross van with the 2kW amplifier (for K84OG) that selsctively chewed up telephones in a radius of 500 feet. What was one more crazy idea!

The Packet system consisted of stock Kenwood TM-201A's, Tucson Packet boards, and Texas Instruments Silent 700 hard-copy devices. Simple 2-meter quarter-wave magnetic mounts were used for antennas. Four frequencies for the HT's and packet system just outside the 2-meter band were obtained through the cooperation of the Department of Defense to avoid any conflict of using Amateur Radio for "commercial purposes." Once installed, and after a five-minute training session, the system worked almost flawlessly until one day the personnel secretary came over to the van and said, "I thought you said this thing worked. Well, it's broken, and hurry up and fix it because we depend on it!"

Wait a minute! This was an experiment ... no amount of talk was going to suffice. The board was substituted, and the system ran 24 hours per day for 11 days. Over 1,300 messages were sent and received, hours were saved by not having to shuttle handwritten messages over a distance of two miles through (om game days) as many as 80,000 people going to the games.

Packet Radio, indeed, helped solve a problem at the 1984 Stanford, California Olympics.

<< Welcome to the WD4LHF-BBS system! >>
West Palm Beach, FL

W1BEL-1>BEACON:Digipeating for the Tampa LAN using omnidirectional antenna. Use W1BEL to digipeat to the East Coast.

To: TAPR TNC owners:
Fm: NK6K
Re: Software updates.

Since a TAPR software maintanence release will be out soon, I'd like to make sure we have all bug reports and requests for changes in. I'll list the ones I know about here, along with a disposition, if known. Please feel free to make comments on any part of the TNC, hardware or software. Please keep in mind the following though:

There are now at least 1300 TAPR TNCs (Beta + kit) in the world today. Many people have written code to match the current user interface, mailboxes, bulletin boards, host systems, gateways, etc. Ask yourself if your proposed change will require a change in user software. If your sugestion would cause recoding of other ham's software, unless it has a major benefit, we would probably have to turn it down. This is called the real world, which is something you get into when 1300 hams are involved.

A few of the discussions below will seem long and involved. That is because some of the bugs are in more advanced features. The majority of the bugs in the more common features were wrung out in the beta test.

On with the bugs:

1) If RETRY is not 0, the TNC will sometimes disconnect before the retry count has expired. This problem took a long time to find, because we couldn't reproduce it. Someone in the field came up with a reliable way to make it happen. The symptom was affected by both the number of frames in flight, and the number of frames in the buffer waiting to be sent.

KD4NL has made a patch, we are testing it in the LA area now and will release it next week. This should make some people very happy.

2) TNC "locks up". This is a difficult symptom to trace. Most of them are caused by a fault in the hardware. We have found a bug in the software that causes this, to my knowledge only one person has fallen in to this particular hole. This is also patched along with the retry bug.

3) TNC prints garbage on the screen, 64k worth, then comes back. I have heard rumors that the GLB board can send a frame which causes this to occur when it is received by a TAPR TNC. If anyone has firm information on this, please send it in. Sometimes the rumor comes in as "The GLB sends an illegal protocol frame", possibly an I or UI frame with no PID byte. Based on that, and the symptom, we have fixed a problem that would occur if that type of frame was received. If you have any info on this, send it in. This will be fixed in the next software update, i.e. it is not patched.

4) The beacon is not started even if a non zero value for beacon time is stored in novram. True enuff. You must give a BEACON command after every reset. This bug will be fixed in the next software update.

5) The 400 and 800 baud rates for HBAUD that were there in 2.1 disappeared in 3.1. A patch is available for this, and has been sent to the AMSAT guys who needed it. They use 400 baud PSK thru Oscar 10. Fixed in next software update.

6) *** connect request comes out in transparent mode. I can't make this happen. It will happen if CONMODE is CONV, you are currently unconnected, and you manually go into transparent mode by saying TRANS. When a connect occurs, you will go into convers mode and will see all messages. If you want to do this, and remain in transparent mode on connect, say CONMODE TRANS. If anyone has another way of making this happen, please let me know.

7) If your terminal overruns the TNC's input buffer by ignoring an <xoff> character, the TNC will never try to <xoff> you again. Serves you right, too! This bug should be fixed in the next software update. See also improvement #11 below.

8) TRACE 2xxx bit doesn't work. Non-header data is always dumped.

9) Autobaud is a bit flakey. Since the hardware has no specific baud rate measuring capability, an easy fix is simply to limit the autobaud choices to 300 and 1200 baud. If this would have caused a great deal of difficulty in getting your board up the first time, please let us know.

This is the end of the known bugs, i.e. those things which work counter to the way we intended, or counter to the way things were documented.

Following are change requests.

1) Store a line to be transmitted when your TNC is connected to by another TNC. E.g. CTEXT I'M IN THE SHOWER, PLEASE RING BELL. That message would be sent automatically when a connect occured. This one stands a good chance of getting in.

2) Store a line to be transmitted when your TNC refuses a connect from another TNC. You'd like the other guy to see *** WB6UUT busy: MAILBOX IS DOWN. This is a little more iffy. Since the frame used for a connect nak, DM, has no I field, we have to put the text in a UI frame. The connecting TNC would have to have MON ON, and the UI frame would have to follow the same digipeater path back, which may be a different path than UNPROTO packets usually take. Thus, even if you used this facility, you stand a finite chance of it not working. Is this worth the effort to implement? Comments please.

3) Link status check. You'd like the TNC to automatically send a frame to see if the other TNC is still there. If not, your TNC would timeout based on RETRY. The command would be CHECK EVERY/AFTER n, where n is some convenient interval. It would not apply if RETRY was 0. This will require a protocol change or update. Right now, with the poll /final controversy, there is no way to prod the other end into giving a response, short

of sending a zero length (PID byte only) Iframe. This seems a bit tacky. This is on the list of things to get resolved at the next protocol review in September.

4) Discard unacknowledged I frames when a disconnect occurs. Currently, if there are outstanding frame, i.e. frames waiting to be acked or resent, or frames that are in the terminal input queue but as yet unsent, we dump them as UI frames to the UNPROTO address list. This is listed under improvements because this is as we intended it to be, i.e. this is a feature, not a bug. We feel this is a useful diagnostic aid. WE in this paper, by the way, is various combinations of KV7D, KD4NL, and NK6K, depending on which of us is responsible for that part of the code. Comments on this one, please.

5) Implement a TNC resident file transfer protocol. When it comes to file transfers, the TNC was designed to be transparent, just like a modem. In fact, if you go into transparent mode, you can run any program that assumes it's talking to a modem and get the desired results. (And no, it doesn't dial the phone on ATDT commands, wise guy). Note that if you want to transfer 8 bit data you must set the AWLEN and PARITY options correctly, otherwise we'll trash the high order bit. Most data transfer programs will run correctly thru the TNC, as long as their internal timers can handle the inherent delays in packet transmission and digipeating. Implementing a TNC based file transfer protocol would please a small number of users, who would still have to write code on their computer to interface with the TNC's file transfer mechanism. I think the current scheme is the right choice, and is more in line with the division of tasks set out in the ISO seven layered OSI model. Comments?

6) Confirm entry into CONVERS mode. You want a warm fuzzy feeling that the TNC has done your bidding in response to the CONV command. This would require a change that would bother the mailbox/host/gateway crowd. They do a lot of popping in and out of command mode to check status, paths, and other things. An extra message might put the warm fuzzy message into a file, unless they modified their code. Comments?

7) Go back into command mode after a disconnect initiated by the other TNC. Currently, you are left in CONVERS or TRANS mode. This should not both mailbox/host types since ctl-C in command mode is ignored. Comments?

8) Implement a watchdog timer. Have the software pulse a bit on the parallel port at some inner point only reached if the software is running correctly. This is so mountain top digipeaters can reset themselves if something bad happens. Note that this is different than the hardware transmit timer. Good idea, and it will probably be in the next release.

9) Print the digipeat list when

a) Someone connects to you
b) When you get a connect request
c) When monitoring the frequency.

I think a) and b) should be done all the time. c) would add to an already cluttered monitor mode. Anybody see a better way of doing it. Adding another command to enable this would add to an already lengthy command list. MPATH has been suggested.

10) Print connect and disconnect packets in monitor mode. How about

NK6K>WB6YMH <C>
WB6YMH>NK6K <D>

There are connect ack and disconnect ack frames, but that might be getting carried away.

11) Increase the number of bytes that the TNC will handle from the terminal after the TNC signals <xoff>. Currently, you must stop within five bytes. After that, the TNC sends another <xoff> after each of the following five bytes. After that, any characters received before the TNC sends an <xon> are discarded. While this has not been a problem for users writing file dumpers in assembler or some high level languages, it has been a problem for programs which dump a line, then look in their input buffer for <xoff>. We will probably increase the guard space to at least 80 characters. Anyone need more?

12) Output <CR> after the callsigns on monitor lines. This would give more room for digipeat paths and not break up data lines as much.

13) Echoing xoff and xon. Currently, if the terminal sends a flow control character out of sequence (xon before xoff, 2 xoffs in a row, etc.), the TNC treats such characters as data and echos them. This has the interesting effect of locking some terminals. It has been suggested that we eliminate this feature and ignore those characters.

That's the list as I know it to be. Submit any others to the TAPR PO box. Now that we've got a secretary, she's in charge of not loosing them.

Remember, the TRACE command is handy for looking at the protocol and seeing exactly what the TNC sent/received, including user data. Please include hardcopy of traces for protocol error reports.

NK6K for KV7D and KD4NL, TAPR Software Group.

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The rapid growth of FADCA membership has caused delays in response to inquiries for information, and related mailing list problems. Pat Shaughnessy, KF4EF, has agreed to serve as Membership Services Director. He has begun to get the membership records and requests for information up to date. Back issues of the BEACON are in stock. If you have not received all issues to date, please write to the FADCA address and state what you need.

HURRICANE DIANA AND PACKET RADIO
BY, JOEL KANDEL KI4T

AS THE AMATEUR RADIO OPERATORS OF DADE COUNTY ARPSC OPERATED THE AMATEUR STATION THEY SET UP AT THE NATIONAL HURRICANE CENTER, IT BECAME VERY EVIDENT THAT THE WAS ROOM FOR PACKET RADIO IN THE HURRICANE COMMUNICATIONS.

THE NOAA WEATHER BULLETINS ARE SENT OUT VIA PHONE LINE, ASCII CODED, TO SUBSCRIBERS ALL OVER THE COUNTRY. MOST OF THESE SUBSCRIBERS THE INFORMATION TO KEEP THEIR LISTENERS INFORMED OF THE WEATHER DEVELOPMENTS. AT THE SAME TIME THESE BULLETINS ARE RETRANSMITTED BY VOICE OVER AMATEUR RADIO INTO THE EFFECTED AREAS SO THAT THE LOCAL HAMS CAN WARN THE POPULACE OF IMPENDING WEATHER. MANY TIMES PHONE LINES GO OUT, AND ALL THAT IS LEFT OF COMMUNICATIONS IN THESE AREAS ARE AMATEUR RADIO STATIONS.

IT WOULD BE A RELATIVELY SIMPLE TECHNICAL MATTER TO CONNECT A TNC INTO THE ASCII WEATHER NETWORK, SO THAT AT THE SAME TIME THE PHONE LINE BULLETINS WERE BEING SENT OUT, THE VERY SAME WEATHER MESSAGE WAS BEING SENT OUT OVER PACKET TO SURROUNDING AREAS. AT PRESENT, DISTANCE TRANSMISSIONS OF PACKET INFORMATION ARE LIMITED, BUT IT WOULD PROVE AN EXCELLENT TOOL FOR LOCAL SATURATION OF WEATHER INFORMATION IN THE SOUTH FLORIDA AREA. PRELIMINARY TESTS HAVE ALREADY TRANSMITTED WEATHER INFO FROM THE HURRICANE CENTER AS FAR NORTH AS MELBOURNE. THE MIAMI PACKET GROUP WILL BE BUSY AT WORK IN THE VERY NEAR FUTURE INTERFACING NHC WITH PACKET. MORE ON THE SUBJECT LATER.

WA4IYY>BEACON:Okeechobee City ** DIG ON ** CONOK Off.

RF DESIGN ASSISTANCE

FADCA has a small group of engineers from Motorola who want to design some 902-928 Mhz radio hardware for the network linking digital switch (Xerox 820 and follow on) They need someone to work with on what the requirements are, what the interface might look like, etc.

Tom, K4GFG, is Chairman of the FADCA RF Design Committee. He needs a contact assigned to his RF design group from digital hardware groups in other areas (is there a national digital design group TAPR?). K4GFG will work with him to insure that the radio will interface. Rather than propose a radio design, we'll leave it pretty wide open at this point, pending discussions with the digital people. Competent bodies are available and are looking for coordination and interface information.

Tom can be reached via Compuserve, or directly at this address:

Tom Kneisel, K4GFG
1600 S. W. 115th Ave.
Davie, FL 33325

FADCA ORGANIZATIONAL MATTERS
Gwyn Reedy, W1BEL

In an effort to provide a broad base of leadership for FADCA, Ted and I are establishing a board of directors for the organization. The initial board will be appointed, and will subsequently stand for election when the procedures are worked out. Directors will be appointed from all the major areas of packet activity in the state. When the election process is worked out, I do not see a strong reason to maintain the geographic relationship.

Directors will be expected to provide regular and timely guidance about the conduct of FADCA affairs. The day to day duties of administering the organizaton will not belong to the directors, but to the officers they appoint. Directors may hold office or committee posts as well as directorships. Business will be conducted by mail, telephone, voice and digital radio, and occasional meetings at major hamfests.

The initial director slots will be for the following areas:

Jacksonville
Orlando
Melbourne
Stuart
Ft. Lauderdale
Miami
Tampa/St. Petersburg
Brandon

The Stuart and Brandon slots are for Ted and myslef since we have been running the organization since it was founded. The names will be announced next month when all the appointees have been selected and have agreed to serve.

FADCA has grown tremendously. In ten months our paid membership has passed the 100 mark and September saw 18 new members. I would like to see an informal membeship drive in which each existing member would bring in one new member (or as many as possible.) There are significant economies of scale in newsletter production that reduce the cost of serving each new member.This growth in numbers will permit the new directors to have a few dollars of dues funds to work with in support of FADCA activities. For the year to date, income has just matched the costs of newsletter publication and printing costs for hamfest distribution. Please send in your comments and opinions on these matters to the letters to the editor column.

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MOBILE PACKET QSO

On Saturday September 22, 1984 the South Brevard Amateur Radio Club in Melbourne, Fl.in cooperation with the local area Packet Radio group held a first totally portable-mobile QSO on packet radio.

With AC7N (Pascal Nelson) at the wheel and N5AUV (George Kremkau) at the key-

board, a mobile QSO was held with WB9IVR (Bill) and N2WX (Howie) in Melbourne, and with K4NTA,(Ted) in Stuart routed thru the digipeater in Palm Bay.

The equipment consisted of an Epson PX-8 portable computer, a GLB PK1 tnc, a 2AT Icom handheld, a Avanti mobile antenna, and the Honda Civic of AC7N on the road around the Melbourne area.

This demonstration was again another example of the possible usebility of packet radio to be totally portable ready for use in any situation along with the 100 % reliable transmission of information.

The demonstration also gave other hams as well as non-hams an opportunity to see packet radio in action during the Peoples Parade of Achievements sponsored by the Today Newspaper at the Melbourne Square Mall.

Many thanks to those involved in this "first" for Melbourne, and those who helped out at the Mall presentation, K3AAX-Dave, N4IIA-Charlie, and KB4IU Jack. Everyone learned a lot and much interest was generated for packet radio by this weekend presentation.

<DE GEORGE KREMKAU N5AUV>

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THE HOMEBREWED FRAME
Howard Goldstein N2WX
681 Cardinal St SE, Palm Bay FL 32907-4116
or via K4NTA BBS on SOUTHNET

MELBOURNE DIGIPEATER. The Melbourne area digipeater is finally a reality. Thanks to the efforts of Dave Frey K3AAX, a tall site was located Southwest of Melbourne and a 4 bay set of phased dipoles was installed. The pattern is such that it forms a cardoid pattern with peak gain (9db vs. dipole) towards the West Southwest and the `null' (which is actually 1.5db gain) is in the opposite direction. There appears to be a solid path between the this machine (N2WX-7) and K4NTA-1, the Stuart machine, and stations from Orlando such as K4AHO and KF4W are also seem to be accessable when their boards are powered up. Even the west coast and W1BEL and VE3ILW are available a good many evenings.

A Xerox 820 Big Board with state machine (described in the May 1984 BEACON), a homebrewed Exar modem, and a commercial Regency rig make up the digipeater package. Dave designed a watchdog circuit for the Big Board that resets the system in the absence of the "I'm OK" square wave generated by the main line code. The entire atchdog fits on a 16 pin header, earning the nickname, `Doggie Dip'.

Melbourne digipeater has a few remote commands. The "heard log" is at this time the only one available to non-control operators. If you have any ideas for things that ur non-control folks could do, pass them along.

Upon receiving an /MLBLOG command, the digipeater returns an Unnumbered Information frame addressed to the commanding station, via a reversed digipeater path if any were present on the command frame. The frame has a list of up to twenty-six of the callsigns COPIED by the machine since it was last reset. The machine is continually updating its internal list with the source call extracted from any correctly received AX.25 level 2 frame - there is no requirement that a frame has to be digipeated through the machine to get put in the log. Dupe calls do not result in duplicate log entries. The returned frame is read left-right, top-down order -- just like a book, with the most recently heard calls at the top-left of the `heard' frame. The 27th unique call pushes the oldest entry off into the bit-pit.

Instructions for use of the heard log were in the August 1984 BEACON, or may be retrieved by SOUTHNET users on the K4NTA bulletin board system, message #1244.

CHIP NOTES: The AMD Worldchip (TM) modem-on-a-chip (AM7910) was used on the Melbourne digipeater for around 3 weeks in August and September. The performance of the machine with the 7910 was admirable in most respects but possibly is less than optimum for use with a radio. There is the "White Noise Problem". Just what is the "White Noise Problem" you ask? In the presence of white noise (like the noise of an unsquelched empty channel), this chip asserts its CARRIER DETECT* output. This creates problems for those who want to run unsquelched and those running with a squelch; Unsquelched operation is not possible because the transmitter is always held off, and squelched operation is not much better if the squelch is not extremely tight because the white noise present in the interval between the dropping of the remote's carrier and the squelch closing up also holds off the transmitter.

Collisions (and heartache) can be caused unless all stations within the service area are running with high DWAIT settings, due to this squelch-closing delay sitting at the very tall digipeater. One may get around this problem by installing seperate carrier detect circuitry, possibly defeating the purpose of installing this modem to begin with. Or folks good with rigs could modify their squelch circuitry to close faster. And those of us who have old rigs might decide that it is now good time to buy a new one!

Z8530A: The 8530 SCC behaves just like a Z-80 SIO when in SDLC mode when the external status interrupt enable bits are initialized to where only Z-80 SIO type external status interrupts are generated (i.e., no Zero-Count interrupts). This means what you have already done for an SIO is, for the most part, portable to the SCC and vice versa - except the initialization of the SCC's DPLL and baud rate generator - and these are available only on the SCC anyway.

Some features, such as individually settable Interrupt Enable (IE) bits for the external status sources, and a switch to automatically send an abort when the transmitter underruns

instead of CR bytes, can make talking to the chip more straighfoward. Be careful if you use these and want to maintain compatability with the Z-80 SIO. Good reason to keep it modular, gang.

One "feature" of the SCC is bound to cause problems to user's of this chip if they are running it with a squelched rig. The SCC's DPLL, and therefore its data clock, are held in a steady state until a transition occurs on the SCC's read data line. The problem expresses itself when you attempt to transmit through the SCC and nothing has caused the DPLL to start, leading your software to believe that it's taking an infinite amount of time for the SCC to request the next character of a frame (after you have sent it the opening character).

"My data clock has the jitters during transmit": With the SCC (and also with the WB6YMH state machine), any transitions on the received data line cause a correction to take place with the DPLL!! You *MUST* make sure that there is absolutely nothing happening on that line when you are transmitting or else the transmitter will be clocking on an asymetrical waveform, which on its own does not constitute a problem but is bound to perform erratically when the frequency of the clock is changing! You full-duplex types are going to have to watch out for this effect unless you're monitoring a signal from the station you're sending too.

MELBOURNE LAN NOTES: New fingers behind the keys include N4BE/Jim, N4DNW/Bill, KB4IU/Jack, and AC7N/Pascal. Hamfest demonstrations are an extremely powerful way to attract new users to packet. Most hamfest committees are more than happy to exchange a booth (remember to get one with 110V AC!) for an introductory paket radio talk to spruce up their technical program. W1BEL/Gwyn gave an excellent talk on packet to an overflowing, tropical rain storm soaked audience at the Melbourne hamfest. The payoff for the 'fest coordinators was a lot of satisfied customers who are going to remember Melbourne for its fine technical program. For packet I'll just say that there are at least six new stations on who are known to be direct results of the FADCA presence. And don't forget to thank everyone - Thanks to all who helped make our's succeed!

Traffic handling was the idea behind a big Melbourne/South Brevard county LAN turnout at the local mall this weekend. Sociologists are saying that malls are becoming the new hangouts, and the South Brevard Amateur Radio Club hung out its banner to pick up new recruits for the novice class and to pass the good word of Amateur Radio to the masses.

Forty-two messages were taken from the public and were trasferred via a GLB at the hamfest, through K3AAX/R or AC7N/R (GLB's in a car in mall the parking lot), to the Melbourne digipeater, and then to a TAPR at N2WX hooked up to a multi-user OASIS system. Ops at the mall entered the messages in NTS standard format using the system's text editor. Depending on destination, the messages were either relayed to other packet stations on SOUTHNET or were sent on the All Florida CW Net (QFN) the day they were originated. Of the forty-two messages, 12 were sent to destination cities for delivery via SOUTHNET.

Murphy's ugly head reared itself when we found that the lighting or whatever in the mall seemed to be RF powered, happening to be right on 145.01. The porta-peaters (no relation to those ubiquitous potties) resulted in a solid connection to the text editor.

Also a number of mobile packet QSOs were held during the demo weekend. N5AUV/George has written about this elsewhere in the BEACON. Jack Demarest, KB4IU, will be picking up the news column for South Brevard next month. This should give me an opportunity to focus on other projects that have been stacking up here, and also give you a fresh look on packet happenings on the Space Coast. I am looking forward to having Jack on line with the news and information of the area.

WA3QFN>BEACON:Neil in Clearwater savi.. connects to disk.

PACKET RADIO APPLICATIONS
JIM DIGGS, K4AHO

Over the last few months, packet radio has experienced a phenominal growth in Florida and probably in the whole country as well. The greatest usage here in Florida has been "chit-chat" with a few file transfers going on late at night. There are computer bulletin boards active also. All these activities are only just scratching the surface of what packet radio can really do.

One area where much work needs to be done is optimizing terminal programs for packet radio. The needs of packet radio are common so this discussion should apply to all computers. There are many good terminal programs on the market but most are copy protected making modifications difficult. I think it is best to start with a simple program and add the needed features. Although an adequate program can be written in BASIC, either assembly or a high level compiled language will do a better job. Some of the optimizing features would be automatic buffer, autoresponse, automatic buffer save, automatic trace function, automatic TNC beacon and unproto parameter setting and others. The automatic buffer would become active only when the TNC has sent a "***Connected to " message to the terminal and disabled when the TNC sends "***Disconnected " message. Therefore the TNC monitor mode can stay selected but not fill up the buffer. The auto response when selected can give an annoncement that the operator is not currently available and give instructions on how to use the mailbox system. The same announcement can include instructions to the TNC to enter the command mode, issue a connect command including the path the connecting station is using, and reenter the conversation mode. The

connecting station will leave a message and then disconnect which will shut the buffer off. The messages will stack up in the buffer and them be saved to disk or printer by a single aommand. The upload feature can be used to set the Beacon Text and Unproto command which currently must be typed in by hand. The autobuffer and auto response features are now active on the Commodore C64 terminal program called J PAC. The autotrace and autosave sommand will be implemented soon. Currently the software flow control routine for upload is being developed. This terminal program will be shared with FADCA members and be made available to others by donation.

Other applications cn be common graphics programs which will enable the packet user to share pictures much like RTTY users currently do. This will probably be a difficult task to make the data files transferrable between different computers. If all output goes to a bit-mapped printer it will not be impossible. The possibilities of high resolution pictures transferred by packet radio are truly intriguing. It may replace SSTV. As an extension of high resolution graphics a multi-player adventure game can be implemented on packet radio much like compuserve's "Mega Wars." That mode could boggle the mind with possibilities.

The usage of packet radio on amateur radio is in its infancy but is growing at a truly impressive rate. To sustain that rate and justify the addition of high speed links now in discussion, applications of packet radio at a user level deserves more attention than it is getting in Florida. This is why it is necessary to be aware of the limitations of a "Dumb Terminal" and plan the user station to use the flexibility of a computer to explore the possibilities of packet radio.

KF4I>BEACON:LISTENING FM JENSEN BEACH

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This is a sample session on the SOUTHNET BBS. Examples were saved from direct on-the-air operatons.

```
cmd:c k4nta v k4nta-1

*** CONNECTED to K4NTA
 Stand by for AUTO-LOGON
Logging on W1BEL VIA K4NTA-1
You are caller # 2350
Logging W1BEL at 10:58:47 on 09/12/84
Bulletins (^P to skip) -

If the BBS just said that you are a NEW USER,
use the [A] command from the main  COMMAND
prompt to add yourself as a user.


End of bulletins

Last on : 09/12/84
High Msg.: 1410
System contains 113 message(s),
 1 to 1411

Command (? for HELP):?

Valid Commands:
?: Prints this list
A: Add Name to User List
B: Print Bulletins
C: Chat with SYSOP
E: Exit MICRO-80
L: Leave a message
N: Print section names
R: Retrieve message
S: Scan messages
T: Time on system
U: Print user log
V: Set Section mask
X: Change/Examine user record
Z: Upload/Download

Command (? for HELP): L

To  : ALL BEACON Readers
Subj: Example Message
 1:This is an example of leaving a message on
the SOUTHNET (K4NTA-1)
 2:Bulletin Board System.
 3:

Subcommand (? for HELP): ?

Valid subcommands:


A: Abort
C: Continue
D: Delete Line
E: Edit Line
L: List Message
P: Preview Message
R: Replace Line
S: Save Message
   SP: Save Personal
   Sx: Save in Section x (0-9,A-E)

Subcommand (? for HELP): S

Message # 1412 saved

Command (? for HELP): RN

Msg  : 1412   Sec. 0 - GENERAL
Date : 09/12/84 11:02:50
To   : ALL BEACON READERS
From : W1BEL
Subj : Example Message

This is an example of leaving a message on
the SOUTHNET (K4NTA-1) Bulletin Board
System.


(C RE T) (D=Delete): RE
 1:This is an example of a reply to a
SOUTHNET BBS message.
 2:

Subcommand (? for HELP): S

Message # 1413 saved

Msg  : 1412   Sec. 0 - GENERAL
Date : 09/12/84 11:02:50
To   : ALL BEACON READERS (R)
From : W1BEL
Subj : Example Message


(C RE T) (D=Delete): C
```

```
Command (? for HELP): RN

Msg  : 1413   Sec. 0 - GENERAL
Date : 09/12/84 11:08:08
To   : W1BEL
From : W1BEL
Subj : Example Message


This is an example of a reply to a SOUTHNET
BBS message.

(C RE T) (D=Delete): C

Command (? for HELP): E

Log-in time : 10:58:47
Present time: 11:19:27
Total time  : 00:20:40
*** DISCONNECTED
```

MELBOURNE MEMORIES

By: Jim Eberwine, W4APV
8118-37th Avenue North
St. Petersburg, Florida 33710
Phone: (813) 347-0942

I departed St. Petersburg at about 0530 on the morning of 08 September 1984. I arrived at Gwyn's (W1BEL) QTH in Brandon, Florida at approximately 0620. We left Brandon about 10 minutes later at 0630, towing a two wheel trailer behind Gwyn's automobile. The trailer was for all of Ham Radio apparatus that we were to pick up in Melbourne. We arrived at the Melbourne Auditorium at about 0855.

The second place visited within the Auditorium was the FADCA set-up. At the FADCA table, Dave (K3AAX) and Howard (N2WX) were very busy demonstrating packet radio to the uninitiated masses of Amateur Radio operators swarming around the table. Dave and Howard had a 2 m packet radio set-up on the table top such that the visiting Amateurs could get their "hands-on" the keyboard, thus becoming a part of the demonstration. With just an indoor fiberglass antenna without radials (marine mobile type antenna) , several connections were made with Miami stations via the the Palm Bay digipeater N2WX-7. Needless to say , these connections with South Florida stations over 150 miles down the coast served to whet the technical appetite of many of the uninitiated.

Here at the FADCA table, I had the pleasure of meeting many of the Florida East Coast packeteers for the first time. A very impressive group of individuals indeed. At least one of these fine gentleman (Dave, K3AAX), I had met at a previous Melbourne Hamfest.

Gwyn (W1BEL) had ordered 8 to 10 TAPR kits (on consignment) for this hamfest, however they did not arrive in time. Meanwhile, Dave (K3AAX) had received 5 GLB boards on consignment. All 5 of these boards where sold. Three were sold the first day and the remaining 2 were sold on Sunday. He probably could have sold more had they been available. This is just one small indication of how rapidly Amateur packet radio is growing here in the Sunshine state.

At 1300, I attended the packet radio meeting held in the Melbourne Library. This seminar was organized by Howard (N2WX) and Gwyn (W1BEL) delivered the lecture. The entire session (lecture plus question and answer period) ran well over an hour with a great deal of interest exhibited by all in attendance.

After the seminar, at about 1430, several of us adjourned to Ho Jo's on U.S. #1 in downtown Melbourne. Here we conducted a "packet-racket" !!!!! A packet-racket is to packeteers as a conference, bull session or BS (brain storming ???) session is to normal folks. This "racket" was attended by the following nine packeteers: Tom (K4GFG), Ted (K4NTA), Guy (KA4VWW), Joel (KI4T), Howard (N2WX), Gwyn (W1BEL), Jim (W4APV), Doug (WB4KXY) and Guy's son (call-sign unknown). Just about anything and everything concerning Amateur packet radio was discussed at this meeting. However, the primary topic was linking in general and high speed (high information rate) linking in particular. The discussion covered the various and sundry linking problems (both known and potential) and the possible solutions to these problems. That is, linking software, digital hardware and RF hardware problems and the various proposals for solving these problems were the topics talked over. Some of the high lights of these discussions follow:

SOFTWARE & DIGITAL HARDWARE:
Howard (N2WX, the FADCA software and digital guru) is currently working with some surplus Tele-Video boards with the intent of using these inexpensive digital hardware devices for packet switching and control purposes. I hope that we will hear more from Howard on this subject in the near future.

GATOR I RF LINKING HARDWARE:
When the 2 m N2WX-7 digipeater was installed in Palm Bay, an additional run of 75 ohm, 7/8 inch hardline was also installed. This transmission line extends up to the 280 foot level. This line is slated for use with the East Coast end of the GATOR I alpha 220-225 MHz band link to the Tampa Bay area on the West Coast. Dave (K3AAX) informed me that he has a Regency HR-220 transceiver for use at the Palm Bay end of the link. He now has a complete high power (Power output = 350 W approximately) RF PA to go with the HR-220 exciter. This PA is now here in Seminole, Florida, waiting to be picked up. More about this crazy deal later. Tom (K4GFG) agreed to assist with the design of the 220-225 MHz receiver IF filtering and detection aspects of this project. His expert help will be greatly appreciated. If I can find the time there will be a much more detailed report on the GATOR I alpha link in the next issue of the BEACON (provided Gwyn has room for it).

GATOR II RF LINKING HARDWARE:
Tom (K4GFG) and his cohorts are continuing with their efforts towards the development of 1240-1300 MHz band and 902-928 MHz band RF hardware. He reported that the 902-928 MHz allocation (when released for ARS use) would be a better band than the 1240-1300 MHz band for high speed packet radio linking purposes. This is primarily due to the greater availability and lower cost of active RF

devices for the lower frequency range. He also pointed out that the frequency range of most of the RF test gear now available to him does not extend beyond 1.0 GHz.

Later on Saturday, at approximately 1930, the packet gang got together at a Melbourne steakhouse for a dinner party. This was a very enjoyable event with much packet radio discussion taking place after the dinner.

On Sunday, 09 September, 1984, Gwyn (W1BEL), Ted (K4NTA) and myself (W4APV) spent almost the entire day taking down two antennas (one HF and one VHF) and a 56 foot aluminum tower (in South Melbourne). This was done during the aftermath of a tropical storm. We got back to the hamfest at 1500, just in time to help fold the FADCA tent. Final comments on the Melbourne Hamfest: We enjoyed it very much and plan to return next year. No hamfest prizes were won, however, I did find time to pick up some goodies from the auditorium vendors (like four virgin 4CX250 sockets. These will be used for a couple of new 220-225 MHz band high power packet linking transmitters ----- why not?).

Most of you know by now that there has been another attempt by various other services to take either all or a portion of the 220-225 MHz band away from the ARS. We need this band for packet radio linking. It is the ONLY VHF or UHF band where it is both practical (relatively inexpensive) and permissible to use high power in conjunction with wide bandwidth high speed data communications -- anywhere in the U.S.A. Remember the 420-450 MHz band power restrictions that we have to live with here in Florida and elsewhere? The last WEST-LINK REPORT that I listened to stated that Senator Barry Goldwater had over 1 k of opposition letters on his desk. I do not consider this response to be sufficient! The message is: It is not to late to write Sen. Goldwater (K7UGA) in addition to your U.S. Senators and Congressman. In stating your opposition to letting other services take away all or part of the ARS 220-225 MHz band, make sure that you mention the needs of Amateur packet radio. Another thing; I sincerely believe that packet radio will one day play the greater role in ARS emergency communications via RACES & ARES. The addresses of Sen. Goldwater and your (Florida) U.S. Senators and Congressman are as follows:

Honorable Paula Hawkins
147 Dirksen Senate Office Building
Washington, D.C. 20510

Honorable Senator Lawton Chiles
Suite 450
Russell Senate Office Building
Washington, D.C. 20510

Honorable C.W. Bill Young
Rayburn House Office Building
Washington, D.C. 20515
NOTE: Congressman Young is the representative for Pinellas County. Send your response to the appropriate representative for your district.

Honorable Barry Goldwater
Senate Office Building
Washington, D.C. 20510

Subject: Link box comments
From: Phil Karns, KA9Q

I'd like to throw my two pfennigs into this discussion.

The biggest problem I can forsee with an 8-bit microprocessor doing linking functions isn't SPEED, it's ADDRESS SPACE. As anybody who has done it can tell you, in a large network your memory requirements build up fast. I/O buffers, routing tables, hash tables, control blocks, etc., not to mention the code to drive them all. The availability of memory also greatly influences the performance of the network, even if the CPU horsepower is unchanged. For example, the best way to reduce the overhead of large headers is to increase the maximum packet size. In the DOD Intenet, each gateway must be able to support packets of at least 576 bytes; anything less requires a lot of fragmentation and extra overhead.

Talk to anybody who hacked on the Unix operating system back in the PDP-11 days. More brain power was spent on finding clever ways to circumvent the 64K address space of the PDP-11 by dynamic mapping of data and text segments than on anything else. The first versions of UNIX on the VAX ran slower than on the PDP-11, but nobody cared (for a while) -- now you could write megabyte programs! Another insidious result of working in cramped spaces is that the implementers fall prey to temptation to write their code in a non portable fashion (or language) in order to make things fit. This means that much of the implementation might have to be thrown out and rewritten when better hardware becomes available. I agree that a portable high-level language (i.e., C) should be used. While fullg implementations of C are available for the Z-80 and work well (e.g., Aztec C), the lack of indexed addressing and a suitable number of general purpose registers on the Z-80 really handicaps any compiler's (not just C) ability to generate tight, fast code, again providing the temptation to revert to assembler.

In short, I agree that we should milk as much out of existing hardware (e.g., the 6809 and the Z-80/Xerox 820) as possible, but if we're going to design brand new hardware from scratch it should use a more state-of-the-art processor (i.e., the 68000). The chip isn't that expensive anymore, and Unix development systems ARE becoming widespread. Have an IBM PC? You can now buy Unix for it from IBM, only they call it PC/IX instead. As I understand it, Harold did the original TAPR AX.25 development on a Honeywell 6000; how many of you have Honeywell 6000's? It only takes one person with access to a development system to write code for everybody to use. I still don't know that many people who can generate Pascal code for the 6809, but it hasn't hurt sales of the TAPR board any.

K4RHD>BEACON:SEMINOLE FL.

KB4ZS>BEACON:KB4ZS - QTH - SEFFNER NEAR TAMPA

Re: Phils comments on my comments on level 3 hardware
From: Harold Price, NK6K

As usual, Phil has a good point.

I agree, 64k will be restrictive, sooner or later. But not this year, and probably not the next. Memory space, not processor speed, will be the biggest reason for going to a whiz-bang processor later on. Yes, Dave and I did the high level code development on CP-6, using a HOneywell DPS/8-70 (big brother to a 6000). But, and an important but, the final intergration and a lot of low level chip code, the calibrator, and the debugger, was done by Margaret, who had access to 6809s, a VAX, and an HP64000 development system. Even though the high level code ran flawlessly on CP-6, when it was cross compiled for 6809 by the HP64000, it blew up. Only by knowledge of the 6809 instruction set were we able to track down the bad code generated by a bug in the compiler. It took a solid week, with all three of us in Tuscon, to finish the integration. I agree, as long as one person or a small group of people do have access to what they need, they can supply to code to get the job done. So far, I haven't heard anyone but Z-80 guys volunteering to do the work. The Florida guys have AX.25 digipeaters running on big boards (z-80's) and are hot to trot on level three. The writer of the Kantor Proposal (TCP/IP) is currently prodding an 820 board to see if it will eat the MIT TCP/IP stuff. Dallas is working Z-80. The Rocky mountain crew is Z-80.

It's either Jan King or Larry Kayser who keeps saying that in amateur radio, and elsewhere, it's the guy who actually does the work that calls the shots.

This whole discussion is in the context of the hardware guys asking what type of box should they build. It is assumed here that the guys building the hardware do not plan to write the software, otherwise they'd just go off and do it, and surprise us all for Christmas. A network box is a bit too big of a project for one or two people to do both the hardware and the software, for free in their spare time, and get it done any time soon.

No one in their right mind is going to build a big box with a 68000 in it, and then hope someone will write software for it. The TAPR TNC has a 6809 on it because TAPR's software group (the one before Mgt, Dave, and I) asked for a 6809. The original software group "failed to provide an adequate solution within the available time bounds", i.e. they didn't produce. The fact that they were attempting to do it in FORTH (an odd language) on a 6809 (an odd CPU), may have had something to do with this. They had little help, no one to consult with, and no development tools. In fact, they got burned out writing the kernal and setting up the FORTH environment.

There is currently a large labor pool ready to work on a Z-80. Out of this group, chances are high that someone will actually produce. Some of these people have already shown ability to produce in our freebie environment.

If someone really wants to see a 68000 based controller as the FIRST effort, then they need to take the first step of getting one of the current layer two implementations running on a 68000 if they expect others to design hardware for them to play layer three on.

Phil points out a reason why a new build box should wait a bit. Maybe the attempts to get 820's doing layer three will prove Phil right sooner than I think, and the first prototype networks will have to have address space bigger than 64k. We'll see.

Phil, remember when 4k was large? These kids today have it easy.

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September 7, 1984

Dear Congressman Young:

Chairman Fowler has asked that I respond to your recent inquiry concerning petitions for rulemaking RM-4829 and Rm-4831 and the allocation to the amateur radio service at 220 MHz.

The 220-225 MHz band is now allocated for amateur use on a shared basis with the fixed (point-to-point), mobile and radiolocation services. The radiolocation service, which supports national defense radars, will be phased out by 1990; there are currently no operations authorized in the fixed and mobile services.

The Commission recently received a petition for rulemaking (RM-4831) from Sideband Technology, Inc. requesting that the spectrum at 216-222 MHz be reallocated exclusively for private land mobile services utilizing new, spectrum efficient technology. It also received a petition (RM-4829) from the Land Mobile Communications Council requesting that the 220-225 MHz band be investigated for reallocation to meet the needs of the private land mobile services. Both petitioners are seeking to abtain relief from anticipated spectrum shortages in the private land mobile radio services. These petitions were placed on Public Notice on July 30 in order to give interested parties an opportunity to comment on their merits.

Upon review of the comments, the Commission will decide whether or not it is in the public interest to initiate a proceeding to change its allocation rules. If the Commission does begin such a proceeding, it will publish a Notice of Proposed Rulemaking, giving interested parties an opportunity to comment on particular rule changes. No decision regarding a reallocation will occure until after all these steps are taken.

Be assured that the Commission will give careful consideration to the needs of amateur radio licensees. It is well aware of the public service and technical advances which the amateur radio service has provided.

Sincerely,
Robert S. Powers
Chief Scientist
Federal communications Commission

FADCA>BEACON

The FADCA>BEACON is published monthly by the Florida Amateur Digital Communications Associaton (FADCA), 812 Childers Loop, Brandon, FL 33511. FADCA is a non-profit organization devoted to research, development, education, and public service. Membership is open to anyone interested in supporting FADCA purposes. To join, complete the membership application and send with $10 to cover 1984 dues to the return address below. If you would like further information about FADCA and packet radio, send a self addressed, stamped (55 cents) envelope to the same address.

FADCA membership dues are assessed by calendar year. The dues for 1984 are $10.00. Members joining during 1984 receive all twelve issues of the FADCA>BEACON (Vol. 1.) Dues for all members will come due in January 1985. In order to be fair to new members joining late in the year, a credit of $3.00 toward 1985 dues will be given to persons joining during September and October, and a credit of $5.00 toward 1985 dues will be given to persons joining during November and December. The amount of the 1985 dues will be set by the board of directors.

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